

In the Claims:

Claims 1 to 15 (Canceled).

RECEIVED
CENTRAL FAX CENTER
OCT 12 2007

1 16. (Currently amended) Method for milling a freeform surface
2 on a workpiece using a milling machine, whereby the
3 workpiece is milled by a tool of the milling machine ~~[[in]]~~
4 such ~~a manner so~~ that a desired freeform surface is formed,
5 and to carry out the milling the tool is moved relative to
6 the workpiece along a tool path defined by splines whereby
7 the motion of the tool is controlled based on the splines,
8 characterized in that the splines are calculated directly
9 from support points stored in workpiece coordinates or in
10 machine coordinates in a CAD/CAM system, ~~and, independent~~
11 ~~of the freeform surface to be formed,~~ and the tool path is
12 generated from six splines if the support points are
13 defined in workpiece coordinates, and is generated from
14 five splines if the support points are defined in machine
15 coordinates, whereby one independent spline is produced for
16 each coordinate.

1 17. (Previously presented) Method according to claim 16,
2 characterized in that, for each tool path, the splines are
3 calculated through the use of one or more interpolation
4 parameters which are equal for all of the splines of the
5 respective tool path, so that all of the splines of the
6 respective tool path are synchronized with one another.

4932/WFF:he

- 2 -

1 18. (Currently amended) Apparatus for milling a freeform
2 surface on a workpiece, whereby a tool is adapted to mill
3 the workpiece in such a manner so that a desired freeform
4 surface is formed, comprising a programming arrangement
5 (21) for programming a tool path, and comprising at least
6 one control arrangement (28) for controlling a motion of
7 the tool relative to the workpiece along the tool path
8 defined by splines, characterized in that the programming
9 arrangement (21) is embodied as a CAD/CAM system, and
10 further comprising means (25) allocated to the programming
11 arrangement (21) and adapted to calculate the splines
12 directly from support points stored in workpiece
13 coordinates or machine coordinates in the CAD/CAM system in
14 such a manner so that the means (25), ~~independent of the~~
15 ~~freeform surface to be formed~~, are adapted to generate the
16 tool path from six splines if the support points are
17 defined in workpiece coordinates, and from five splines if
18 the support points are defined in machine coordinates,
19 whereby an independent spline is produced for each
20 coordinate, and wherein the CAD/CAM system is adapted to
21 produce at least one APT file (22), and further comprising
22 at least one downstream-connected post-processor (26)
23 adapted to convert the at least one APT file into at least
24 one control file (27) that is executable by the or each
25 control arrangement (28), and whereby the or each control
26 arrangement (28) is adapted to control the motion of the
27 tool along the tool path based on and in accordance with
28 the splines.

4932/WFF:he

- 3 -

1 19. (Previously presented) Apparatus according to claim 18,
2 further comprising an APT processor (23), characterized in
3 that the means (25) allocated to the programming
4 arrangement (21) are arranged and adapted to transfer the
5 splines to the APT processor (23) which is arranged and
6 adapted to transfer the splines to the or each
7 post-processor (26), whereby the or each post-processor
8 (26) is arranged and adapted to provide the splines to the
9 or each control arrangement (28) in a polynomial format.

1 20. (Currently amended) A method of milling a freeform surface
2 on a workpiece using a miller tool, comprising the steps:
3 a) defining tool path way points, each respectively in
4 six workpiece coordinates or five machine coordinates,
5 wherein said way points define points within tolerance
6 limits along a contour of a nominal freeform surface
7 that is to be milled;
8 b) generating a plurality of splines directly dependent
9 on and fitting said way points sufficiently closely to
10 remain within said tolerance limits of said contour,
11 wherein a respective independent one of said splines
12 is respectively generated for each one of said
13 workpiece coordinates or said machine coordinates of
14 all of said way points, so that said plurality of
15 splines includes a total of six splines respectively
16 allocated to said six workpiece coordinates if said
17 way points are defined in said six workpiece

4932/WFF:he

- 4 -

18 coordinates, and said plurality of splines includes a
19 total of five splines respectively allocated to said
20 five machine coordinates if said way points are
21 defined in said five machine coordinates; and

22 c) moving said miller tool in contact with and relative
23 to said workpiece so that said miller tool mills said
24 workpiece, and controlling said moving of said miller
25 tool based on and in accordance with said plurality of
26 splines respectively allocated to said workpiece
27 coordinates or said machine coordinates so that said
28 miller tool moves along a tool path defined by said
29 splines in said workpiece coordinates or said machine
30 coordinates and thereby mills an actual freeform
31 surface on said workpiece within said tolerance limits
32 of said contour of said nominal freeform surface.

1 21. (Currently amended) An apparatus for milling a freeform
2 surface on a workpiece, comprising:

3 a movable miller tool that is movable relative to the
4 workpiece;

5 plural control arrangements respectively adapted to
6 control a motion of said miller tool respectively in six
7 workpiece coordinates or in five machine coordinates;

8 a programming arrangement ~~programed~~ programmed to
9 define tool path way points in said six workpiece
10 coordinates or in said five machine coordinates, wherein
11 said way points define points within tolerance limits along

12 a contour of a nominal freeform surface that is to be
13 milled;

14 a processing arrangement that is interposed between
15 said programming arrangement and said control arrangements,
16 and that is adapted and programmed to generate a plurality
17 of splines directly dependent on and fitting said way
18 points sufficiently closely to remain within said tolerance
19 limits of said contour, wherein a respective independent
20 one of said splines is respectively to be generated for
21 each one of said workpiece coordinates or said machine
22 coordinates of all of said way points, so that said
23 plurality of splines includes a total of six splines
24 respectively allocated to said six workpiece coordinates if
25 said way points are defined in said six workpiece
26 coordinates, and said plurality of splines includes a total
27 of five splines respectively allocated to said five machine
28 coordinates if said way points are defined in said five
29 machine coordinates; and

30 wherein said control arrangements are adapted to
31 control the motion of said miller tool based on and in
32 accordance with said plurality of splines respectively
33 allocated to said workpiece coordinates or said machine
34 coordinates so that said miller tool is adapted to move
35 along a tool path defined by said splines in said workpiece
36 coordinates or said machine coordinates and thereby to mill
37 an actual freeform surface on said workpiece within said
38 tolerance limits of said contour of said nominal freeform
39 surface.